

REMARKS

The Office Action issued 29 October 1999 has been reviewed and the comments of the U.S. Patent and Trademark Office have been considered. Claim 1 has been amended and new claim 17 has been added. Claims 4-16 stand withdrawn from consideration in view of the restriction requirement mailed 25 October 1999. Accordingly, claims 1-3 and 17 are submitted for reconsideration by the Examiner.

Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 3,413,840 to Basile et al. (Basile) for the reasons given in section 2 of the Office Action. This rejection is respectfully traversed in view of the above amendments and the following comments.

Independent claim 1 recites a combination of features including "measuring and recording a first temperature of the vapor at substantially the first point in time; measuring and recording a second temperature and a measured pressure of the vapor at a second point in time; computing a temperature-compensated pressure based on previously measured values; and comparing the temperature-compensated pressure with the pressure measured at a second point in time to detect a leak."

As discussed in the present application at page 3, line 24, to page 4, line 5, changes in gas tank temperature affect the ability to accurately indicate the existence of a leak in an automotive fuel system. Thus, as demonstrated by the equation in the present application at page 6, line 15, a temperature-compensated pressure, P_c , is calculated by compensating the initial pressure, P_1 , based on a factor derived from the initial and subsequent temperatures, T_1 and T_2 (i.e., the derived factor being $2 - T_2 / T_1$). Then, as discussed in the present application at page 6, lines 21-25, the temperature-compensated pressure, P_c , is compared to the subsequently measured pressure, P_2 , to detect whether or not leakage from the fuel system has occurred. Thus, as discussed in the present application at page 6, lines 25-30, the claimed invention is able to reach an accurate determination of leakage without waiting for the fuel system to stabilize, i.e., leakage can be determined in an unstable fuel system.

Basile discloses (column 1, line 65, to column 2, line 9) a leak detection system for liquefied gas storage in tanks having an inner tank and an outer tank, with a space 3 formed

between the inner and outer tanks. As discussed at column 3, lines 29-39, Basile detects a leak from the inner tank into the space 3 by comparing actual pressure, P_a , as sensed by a pressure transducer 5 (column 3, lines 11-13), with a calculated pressure, P_c , which is independent of temperature changes (column 3, lines 36-39).

In particular, Basile's leak detection system "will be unaffected by any change in temperature of the gas in the barrier [space 3] due to a change in ambient temperature, tank level, etc. since the computed pressure, P_c , is for a given weight at the actual temperature in the barrier" (column 3, lines 58-62). Moreover, Basile teaches that "since actual temperature is a common factor in the actual and calculated terms, it can be treated as a constant without introducing errors into the final readings" (column 3, lines 62-65).

Thus, in contrast to the claimed invention, Basile compares calculated and measured pressure values at a common point in time to detect leakage, and consequently, there is no teaching or suggestion of comparing a temperature-compensated vapor pressure with respect to a vapor pressure measured at a different point in time. Essentially, Basile fails to appreciate the problem addressed by the claimed invention, i.e., leak detection in a system that is unsteady due to temperature fluctuation. Instead, Basile is directed to detecting leaks in a steady, i.e., constant temperature, system.

MPEP § 2143.03 points out that "[t]o establish prima facie obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art. In re Royka, 409 F.2d 981, 180 USPQ 580 (CCPA 1974)." Therefore, Applicants respectfully assert that the rejection under 35 U.S.C. § 103(a) should be withdrawn because Basile does not teach or suggest each feature of independent claim 1. Furthermore, Applicants respectfully assert that dependent claims 2 and 3 are allowable at least because they recite the same allowable combination of features as claim 1, as well as reciting additional features that further distinguish over Basile.

New independent claim 17 recites a combination of features including "measuring and recording a first temperature and a first vapor pressure in the fuel system at a first point in time; measuring and recording a second temperature and a second vapor pressure in the fuel system at a second point in time; compensating the first vapor pressure based on the first and

second temperatures, thereby defining a temperature-compensated first vapor pressure; and comparing the temperature-compensated first vapor pressure with the second vapor pressure to detect a leak in the fuel system between the first and second points in time.” Like claim 1, the prior art fails to teach or suggest comparing a temperature-compensated vapor pressure with respect to a vapor pressure measured at a different point in time.

In view of the foregoing, Applicants respectfully request reconsideration and the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicant’s undersigned representative to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,
MORGAN, LEWIS & BOCKIUS LLP

By:



Scott J. Anchell
Reg. No. 35,035

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MORGAN, LEWIS & BOCKIUS LLP
1800 M Street, N.W.
Washington, D.C. 20036
202-467-7000 (Phone)
202-467-7176 (Fax)